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Re-evaluation Note REV2010-04

Clethodim

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1.0 Background

Clethodim was first registered in 1992 in Canada on a conditional basis and full registration was granted in 2006. It is a member of the cyclohexanedione family of herbicides and is used for post-emergent control of grasses in canola, flax (including low linolenic acid varieties), field peas, lentils, Desi and Kabuli chickpeas, dry onions, potatoes, yellow mustard, oriental (brown) mustard (condiment and oilseed types), soybeans, seedling alfalfa, sunflowers, dry common beans (*Phaseolus vulgaris* varieties only), spinach, coriander and, fenugreek.

Clethodim is applied as a spray by ground equipment only. Clethodim is applied at a maximum rate of 91.2 g a.i./ha on canola, flax, field peas, lentils, dry onions, potatoes, yellow mustard, oriental (brown) mustard, soybeans, seedling alfalfa, sunflowers, coriander and, fenugreek; and at a rate of 45.6 g a.i./ha on Desi and Kabuli chickpeas, spinach, and dry common beans.

2.0 Regulatory Update

The data that were submitted for the registration of the technical grade active ingredient of clethodim are considered to meet current data requirements. Scientific approaches used to assess this data and to establish relevant toxicity end-points are also considered to meet current standards.

Occupational exposure to clethodim is considered acceptable when wearing the personal protective equipment listed on the end-use product label (i.e. goggles or face shield, rubber apron, chemically resistant gloves, rubber boots, long sleeved shirt and long legged pants). Based on the current risk assessments, the acute toxicity and the low irritation potential of clethodim, the PMRA is requiring the minimum (default) 12 hour re-entry interval for all end-use products containing clethodim. There are no residential uses for clethodim, so this aspect does not need to be addressed. Exposure and risk to the environment are adequately mitigated by the current terrestrial buffer zones on the label which mitigates risk to non-target species through spray drift onto terrestrial habitats and aquatic habitats.

Since the original registration of clethodim, the federal government has developed the Toxic Substances Management Policy (TSMP). According to TSMP criteria, clethodim is not bioaccumulative or persistent and the n-octanol-water partition coefficient ($\log K_{ow}$) is 4.4, which is below the TSMP Track 1 cut-off criterion of ≥ 5.0. Further, a fish bioconcentration study indicates much less bioaccumulation potential (BCF = 3.5) and a rapid rate of depuration. Clethodim does not meet all Track 1 criteria, and thus it is not a candidate for Track 1 classification as per the Federal Toxic Substances Management Policy and the Regulatory Directive DIR99-03.

Use of clethodim as a herbicide for post-emergent control of grasses in canola, flax, field peas, lentils, chickpeas, dry onions, potatoes, mustard, soybeans, seedling alfalfa, sunflowers, dry beans, spinach, coriander and fenugreek is considered to be associated with acceptable risk. Clethodim is acceptable for continued registration, provided end-use product labels are amended to include updated label statements (see Appendix I).

3.0 Supporting Documentation

PMRA documents, such as Regulatory Directive DIR99-03, and DACO tables can be found on our website at www.healthcanada.gc.ca/pmra. PMRA documents are also available through the Pest Management Information Service. Phone: 1-800-267-6315 within Canada or 1-613-736-3799 outside Canada (long distance charges apply); fax: 613-736-3798; e-mail: pmra.infoserv@hc-sc.gc.ca.

The federal TSMP is available through Environment Canada's website at www.ec.gc.ca/toxics.

Appendix I Label Amendments for Products Containing Clethodim

Based on the Canadian use pattern of clethodim, Canadian commercial end-use product labels must be amended to include the following statements:

For commercial end-use products containing clethodim, the following must be included in the section of the label entitled "**PRECAUTIONS**":

- **DO NOT** enter or allow worker entry into treated areas for 12 hours following application.

For commercial end-use products containing clethodim, the following must be included in the section of the label entitled "**DIRECTIONS FOR USE**":

- Apply a maximum of one application per season on dry common beans (*Phaseolus vulgaris* varieties only).

References List of Studies/Information Submitted by Registrant (Unpublished)

PMRA Document Number: 1227461
Reference: Uptake, Depuration and Bioconcentration of [allyl-2-14c] and [cyclohexene-1-one-4,6-14c] re-45601 to bluegill sunfish (8728216), Data Numbering Code: 9.5.5.

PMRA Document Number: 637505
Reference: 2003, Physical State, Shape, Colour And Odour Of Clethodim Agan Technical. Data Numbering Code: 2.14.1, 2.14.2,2.14.3. Confidential Business Information.

PMRA Document Number: 637507
Reference: 2003, Boiling Point Of Clethodim Agan Technical. Data Numbering Code: 2.14.5. Confidential Business Information

PMRA Document Number: 637508
Reference: Determination Of The Density Of Clethodim Agan Technical. Data Numbering Code: 2.14.6. Confidential Business Information.

PMRA Document Number: 637509
Reference: 2003, Thermal And Air Stability Of Clethodim Agan Technical. Data Numbering Code: 2.14.13. Confidential Business Information.

PMRA Document Number: 637511
Reference: 2003, Solubility Of Clethodim Agan Technical In Water And Organic Solvents. Data Numbering Code: 2.14.7, 2.14.8. Confidential Business Information.

PMRA Document Number: 637512
Reference: 2003, Vapour Pressure Of Clethodim Agan Technical. Data Numbering Code: 2.14.9. Confidential Business Information.

PMRA Document Number: 637513
Reference: 2003, Dissociation Constants In Water Of Clethodim Agan Technical. B, Data Numbering Code: 2.14.10. Confidential Business Information.

PMRA Document Number: 637514
Reference: 2003, Partition Coefficient (N-Octanol/Water) Of Clethodim Agan Technical. Data Numbering Code: 2.14.11. Confidential Business Information.

PMRA Document Number: 637515
Reference: 2003, UV/VIS Absorption Spectra Of Clethodim Agan Technical. Data Numbering Code: 2.14.12. Confidential Business Information.

PMRA Document Number: 637500
Reference: Manufacturing Summary. Data Numbering Code: 2.11.1. Confidential Business Information.

PMRA Document Number: 1498830
Reference: 1995, Specifications and Analytical Methodology Required for the Registration of Clethodim. Technical including appendices 1, 2, 3 and 4, Data Numbering Code: 2.1,2.16. Confidential Business Information.

PMRA Document Number: 637503
Reference: 2003, Clethodim Technical (SULI) Five Lots Analysis And Method Validation. Data Numbering Code: 2.13.1, 2.13.3. Confidential Business Information.

PMRA Document Number: 1292788
Reference: 2006, Clethodim Technical (Wanquan) - 5-Lots Analysis and Method Validation, Data Numbering Code: 2.13.1, 2.13.2,2.13.3. Confidential Business Information.